BULLETIN

OF THE INSTITUTE OF METALS

VOLUME 5 APRIL 1960 PART 8

INSTITUTE NEWS

Secretary Honoured by French Society

Lieut.-Colonel Charles GUILLAN, the Secretary of The Institute of Metals, has been elected an Honorary Member of the Société Française de Métallurgie.

Extrusion Plant Developments: an Instructional Meeting for Younger Members

As previously announced, an Instructional Meeting for Younger Members on the subject of "Preheating and Hot Rolling" has had to be postponed until 1961, because one of the works to be visited is in process of a major re-equipment.

In its place, the Metallurgical Engineering Committee is arranging an Instructional Meeting on "Extrusion Plant Developments", which it is hoped will be well attended.

Accommodation has been arranged at Ashorne Hill, near Leamington Spa, and the visits in connection with the meeting will be to works in the Birmingham area.

Those participating must agree to reside at Ashorne Hill throughout the meeting, and to report before dinner on the evening of Wednesday, 20 July. The course will disperse after lunch on Saturday, 23 July.

The cost per head for the meeting, including accommodation, all meals, transport to and from works visited, and gratuities will be of the order of £10 10*s.* 0*d.*

Lecture on "Deformation and Fracture of Ionic Crystals"

A lecture on "Deformation and Fracture of Ionic Crystals" will be given at the Institute's Headquarters, 17 Belgrave Square, London, S.W.1, at 6.30 p.m. on Wednesday, 27 April. The lecture, which has been arranged by the Metal Physics Committee, will be given by Dr. J. WASHBURN, Associate Professor of Metallurgy in the University of California, Berkeley, Calif. The meeting will be open to visitors and no tickets are required.

Election of Members

The following 13 Ordinary Members, 5 Junior Members, and 5 Student Members were elected on 1 March:

As Ordinary Members

ANDERSON, *Professor* James H., B.Met.E., Professor and Head, Department of Chemical and Metallurgical Engineering, Division of Engineering, San Jose State College, San Jose 14, Calif., U.S.A.

ASHBY, Derek John, B.Sc.Tech., A.M.C.T., A.I.M., Chief Assistant Chemist and Metallurgist, The Oil Well Engineering Co., Ltd., Cheadle Heath.

EVANS, Walter, B.Sc., A.I.M., Lecturer in Metallurgy, West Ham College of Technology, London.

GLANVILL, Douglas William, Technical Assistant Grade II, Aeronautical Research Laboratories, Fishermen's Bend, Melbourne, Australia.

GÜERTLER, Maria, Dr.Chem., Falkenried 29, Berlin-Dahlem, Germany.

HOCKENHULL, Brian Sheridan, M.Sc., Lecturer, Department of Aircraft Materials, The College of Aeronautics, Cranfield.

JONES, Eric, A.I.M., Scientific Officer, Armament Research and Development Establishment, Fort Halstead, Kent.

LUDWIGSON, David Carl, B.E., M.S., Battelle Memorial Institute, Columbus, Ohio, U.S.A.

MENON, P. K. S., B.Sc., Metallurgist, Motor Industries Co., Ltd., Bangalore, India.

RAMU, Narayanaswamy Iyer, B.E., Motor Industries Co., Ltd., Bangalore, India.

RITCHIE, David Fraser, B.A., Editor, *Canadian Metalworking*, Don Mills, Ont., Canada.

ROBINSON, Alan Keith, A.I.M., Chief Metallurgist, Hard Metals Pty., Ltd., Auburn, N.S.W., Australia.

TELL, Björn Vilhelm, D.Ph., B.S., Head of Section, Reactor Development Division, AB Atomenergi, Stockholm, Sweden.

As Junior Members

AKHTAR, Mohammad Salim, Engineering Draughtsman, Lang Pneumatic, Ltd., Wolverhampton.

DAVY, Lyndon George Thomas, L.I.M., Assistant Experimental Officer, Atomic Weapons Research Establishment, Aldermaston.

EYRE, Brian Leonard, Dipl.Tech., A.C.T., Metallurgist, Central Electricity Generating Board, Nuclear Research Laboratories, Berkeley, Glos.

HARRIS, David George, B.Sc., Research Metallurgist, Nuclear Research Centre, C. A. Parsons and Co., Ltd., Newcastle-on-Tyne.

TRUSSLER, Geoffrey Arnold, A.I.M., Scientific Technical Officer, National Coal Board, Mining Research Establishment, Isleworth.

As Student Members

BICKERDIKE, Michael, Laboratory Assistant, Hawker Siddeley Nuclear Power Co., Ltd., Langley, Bucks.

GEORGE, Alan Edward Blundell, L.I.M., Metallurgist, Metallurgical Department, Steel Company of Wales, Ltd., Port Talbot.

KEANE, Donald Matthew, Undergraduate, Department of Metallurgy, University of Liverpool.
SIMMONS, John Graham, Undergraduate, Department of Metallurgy, University of Cambridge.
TUFTON, Philip John, Undergraduate, Department of Metallurgy, University of Cambridge.

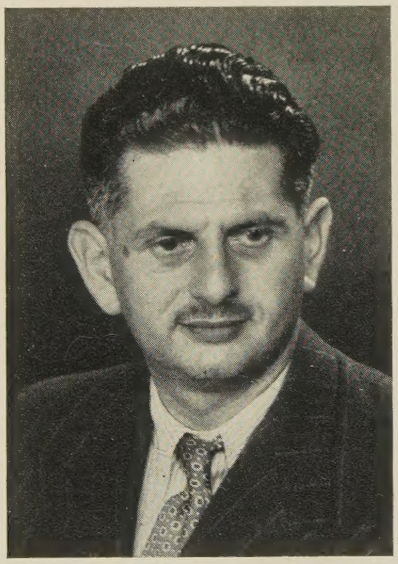
NEW OFFICERS

Below are given biographical details of members who took office as Vice-Presidents and Members of Council at the Annual General Meeting on 29 March.

Dr. H. M. Finniston

(Vice-President)

Harold Montague Finniston was born in 1912 and educated in Glasgow, where he attended the University and the Royal Technical College. He graduated with first-class honours in metallurgy in 1933. After a period in industry with Messrs. Stewarts and Lloyds, Ltd., he returned to Glasgow in 1937 as Chief Research Officer of the Scottish Coke Research Committee. Having gained his Ph.D. degree in 1940, Dr. Finniston joined the Bragg Laboratory of the Naval Ordnance Inspection Department, Sheffield, where he was in charge of the Metallurgy Section until 1946, when he was seconded by the Royal Naval Scientific Service to the Department of Atomic Energy. He went to Canada to organize the metallurgical side of the atomic-energy work there, and on his return in the following year became Deputy Head of the Metallurgy Division of the Atomic Energy Research Establishment at

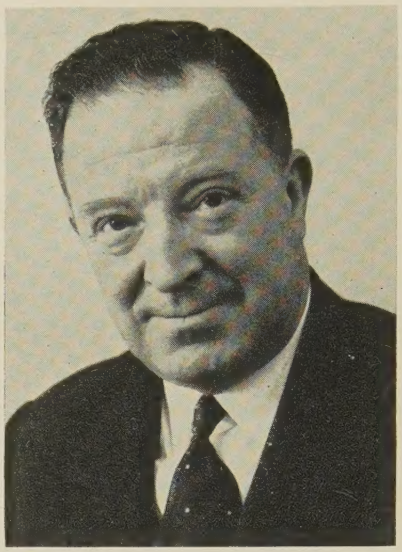


Harwell. In 1948 he was appointed to the post of Head of the Metallurgy Division, and subsequently became Chief Metallurgist. He is now Research Manager at the Nuclear Research Centre of C. A. Parsons and Co., Ltd., Newcastle-upon-Tyne. From its inception in 1951, Dr. Finniston was for two years Chairman of the Oxford Local Section. He has served on the Metal Physics, Nuclear Energy and Local Sections Committees of the Institute and is Chairman of the Publication Committee.

Mr. H. W. G. Hignett

(Vice-President)

Born in 1905, H. W. G. Hignett was educated at Bury Grammar School and decided on a chemical career. However, he became an engineer by *force majeure* and a metallurgist by accident, in due course obtaining an external degree at London University.



After seven years as a metallurgist with Messrs. C. Walmsley and Co., Ltd., of Bury, Lancashire, he joined the Aluminium Plant and Vessel Co., Ltd., London, in 1930. At the end of ten happy years with this Company, under Dr. Richard Seligman, he joined the Development Section of the Development and Research Department of The Mond Nickel Co., Ltd., transferring in August 1945 from the Development to the Research section to become Superintendent of the Research Laboratory in Birmingham. In this position he lasted nine years before being found out and moved to Production —as Technical Director of Henry Wiggin and Co., Ltd. In 1956, he was made Assistant Managing Director.

Mr. Hignett was elected a member of the Institute in 1930 and previously served on the Council from 1942 to 1946 and again from 1949 to 1952. He is a Fellow of the Royal Institute of Chemistry, a Fellow of the Institution of Metallurgists, a Member of the Institute of Welding, the Iron and Steel Institute, the American Society for Metals and the A.I.M.E., Past-President of the Birmingham Metallurgical Society, and Past-Chairman of the Birmingham Local Section. He has just been appointed Chairman of the Metal Physics Committee.

Professor R. W. K. Honeycombe

(Member of Council)

R. W. K. Honeycombe was born in 1921 in Melbourne, Australia. He obtained an M.Sc. degree in Metallurgy at the University of Melbourne in 1942 and subsequently worked in the Commonwealth Scientific and Industrial Research Organization for six years before coming to England in 1948. He spent several years at the Cavendish Laboratory, first as an I.C.I. Fellow and then as Royal Society Armourers and Brasiers' Fellow, obtaining the degree of Ph.D. in 1950.

In 1951 he went to Sheffield as Senior Lecturer in Physical Metallurgy and in 1955 was appointed Professor of Physical

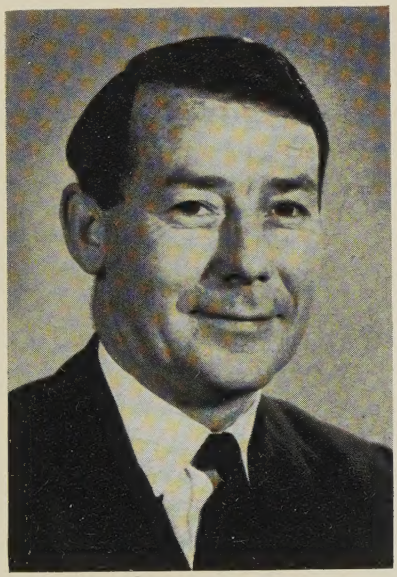
Metallurgy. His research interests include deformation, precipitation processes, and electron metallography. In 1959 he was awarded the Rosenhain Medal. In 1957–59 he was

Chairman of the Sheffield Local Section of the Institute. He is Chairman of the *Metallurgical Reviews* Committee and serves also on the Metal Physics Committee.

Dr. Ivor Jenkins

(Member of Council)

Ivor Jenkins was educated at the Secondary School, Gowerton, and, as a Folland Scholar, studied metallurgy at the University College of Wales, Swansea, where he gained a B.Sc.



degree with First Class Honours in Metallurgy in 1934, and subsequently received the M.Sc. (1938) and D.Sc. (1948) degrees of the University of Wales.

He joined the Scientific Staff of the Research Laboratories of The General Electric Co., Ltd., Wembley, in 1934, to work under Dr. C. J. Smithells. After leaving there for a time in 1944–45 to assist in the establishment of a new Research Laboratory for the Whitehead Iron and Steel Co., Ltd., Newport, Mon., Dr. Jenkins returned to the G.E.C., where he succeeded the late Mr. S. V. Williams as Head of the Metallurgy Department. He was appointed Chief Metallurgist in 1952.

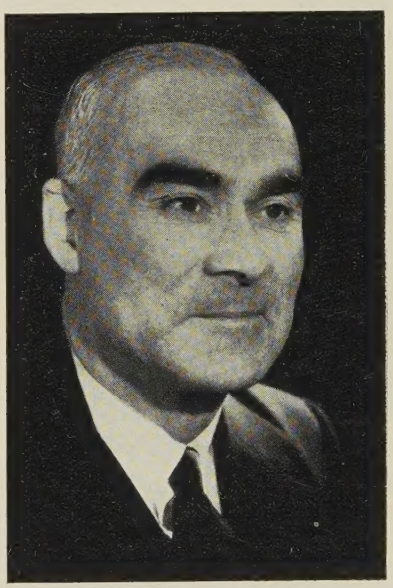
Dr. Jenkins is a member of the Inter-Service Metallurgical Research Council and of various committees of the British Non-Ferrous Metals Research Association and British Iron and Steel Research Association. His publications include a book on "Controlled Atmospheres for the Heat-Treatment of Metals" (1946) and numerous papers on metallurgical problems associated with the electrical engineering industry which have appeared in the journals of several societies. In 1947 he was awarded (jointly with Dr. B. Jones) the Williams Prize of the Iron and Steel Institute.

Dr. Jenkins has been a member of the Institute of Metals since 1932, and he previously served as a Member of Council from 1952 to 1956 and as a Vice-President 1956–59. He served on the Publication Committee for the past ten years and also for a time on the Metal Physics Committee. He is now a member of the Nuclear Energy Committee and the Editorial Board. He was Chairman of the *Metallurgical Reviews* Committee from its formation until last year.

Mr. J. Salter

(Member of Council)

After taking the degree of B.Sc.(Tech.) in electrical engineering at Manchester in 1923, John Salter served an



apprenticeship and obtained engineering experience over a period of five years with the English Electric Co., Ltd., at Preston and Stafford. He joined The British Aluminium Co., Ltd., in 1928 as an Assistant Engineer at their Head Office and in that capacity, over a period of about 16 years, was concerned with the engineering of the Company's extensions and expansion schemes. For the last 15 years his main interest has been in production at the Company's rolling and extrusion plants, occupying managerial positions at the Falkirk factory and at the Company's Head Office. He was appointed General Production Manager in February, 1956,

and was made a Director of the Company in October 1957. He has recently been appointed Director of Engineering.

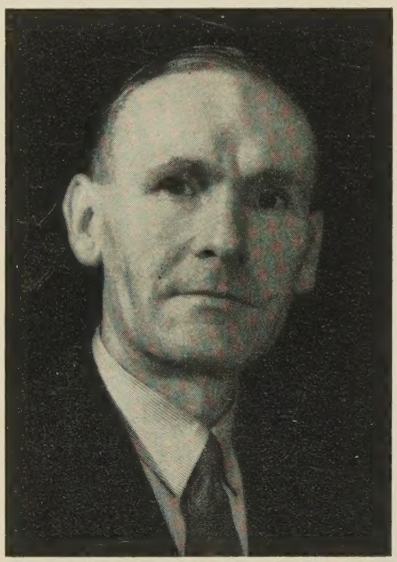
Mr. Salter has been a member of the Institute since 1949 and has served for several years on the Metallurgical Engineering Committee and the *Metallurgical Reviews* Committee.

Mr. Christopher Smith

(Member of Council)

Christopher Smith was born in 1898 and was educated at King Edward VI Grammar School, Aston, Birmingham.

He joined the technical staff of James Booth and Co., Ltd., in 1914 as a laboratory assistant, and later, with the development of Duralumin, was drawn into much more of the early investigation associated with the development, in this country, of aluminium alloys. This work involved the casting, extrusion, rolling, forging, and general working of the now well-established alloys. His interests also covered the production of copper-base alloys and all magnesium alloys in wrought form. From 1935 until 1950 Mr. Smith was Chief Metallurgist to the Company, and in January 1951 he was appointed Works Superintendent. In April 1958 he was appointed a Special Director of the Company. He is also a Special Director of James Booth Aluminium, Ltd.



Mr. Smith was elected a Member of the Institute of Metals in 1938 and previously served on the Council from 1951 to 1955. He was for several years Chairman of the Publication Committee. He is also a Fellow of the Institution of Metallurgists. He is a member of the Research Board of the British Non-Ferrous Metals Research Association, and participates in the activities of a number of committees of the Aluminium Development Association, the British Welding Research Association, and the British Standards Institution. He is also Chairman of the Applied Science Advisory Committee of the College of Advanced Technology, Birmingham.

Mr. Smith contributed a paper entitled "The Extrusion of Aluminium Alloys" to a Symposium on "Metallurgical Aspects of the Hot Working of Non-Ferrous Metals and Alloys" held in March 1951, and for this paper he was awarded the W. H. A. Robertson Medal.

PERSONAL NOTES

Dr. C. Y. Ang has been appointed Director of the Materials Laboratories of P. R. Mallory and Co., Inc., Indianapolis

Mr. D. R. Ashworth has been appointed Assistant Chief Research Metallurgist to the Hawker Siddeley Nuclear Power Co., Ltd., Langley, Bucks.

Mr. G. H. Bannister has left the Atomic Energy Research Establishment, Harwell, and is now with the Australian Atomic Energy Commission, Sutherland, N.S.W.

Dr. J. P. Brull, North American Smelting Co., Wilmington, Del., has been elected Vice-President of the Aluminum Smelters' Research Institute, Chicago.

Sir Horace Clarke has been invited to become Honorary President of the recently formed James Booth Aluminium Co., Ltd.

Mr. A. H. Colley is now a Research Assistant in the Refractories Section of the Chemistry Department of the British Iron and Steel Research Association.

Brigadier H. P. Crosland, Chairman and Managing Director of Metal Traders, Ltd., has been elected Chairman of the Zinc Development Association for 1960.

Dr. Michael Davis has been appointed Chief Inspector (Fuel Elements) in the Production Group of the U.K. Atomic Energy Authority, Risley.

Mr. J. G. Dick, formerly District Manager of Montreal Bronze Co., Ltd., Division of Canadian Bronze Co., Ltd., has now been appointed Manufacturing Manager of all Divisions of the Canadian Bronze Co., Ltd.

Mr. B. Edmondson has joined the staff of the Central Electricity Generating Board. He is at present working in the Metallurgy Division of the Atomic Energy Research Establishment, Harwell, before going to the Board's new Laboratories at Berkeley.

Mr. M. H. Farmer is now at the Corning Glass Works, Corning, N.Y.

Mr. R. N. H. Gardner is now Midlands Area Manager (Technical Sales) of McKechnie Bros., Ltd.

Dr. K. M. Ginsburg has left British Insulated Callender's Cables, Ltd., to take a post as Lecturer at Battersea College of Technology.

Mr. E. J. Hancock has been appointed Sales Director of Savin (Tools), Ltd., Birmingham.

Mr. J. H. Histed has joined the Development Department of Union Carbide, Ltd., London.

Dr. T. P. Hoar has been admitted to the degree of Doctor of Science (Sc.D.) in the University of Cambridge.

Mr. H. A. Hoare is now Materials Engineer, Design Department, A.E.I.-Hotpoint, Peterborough.

Mr. A. Hollingworth is now with Forgings and Presswork Co., Ltd., Birmingham.

Dr. J. P. Hugo has joined the staff of the South African Atomic Energy Board. For the next few months he will be working at the Argonne National Laboratory, Lemont, Ill., U.S.A.

Dr. J. Manenc has left O.N.E.R.A. and is now with the C.E.N. at Saclay (S. et O.).

Dr. M. K. Medhekar has left the Atomic Energy Establishment, Bombay, and joined Premier Automobiles, Ltd., Bombay.

Mr. B. E. Mills has taken up an appointment as research metallurgist in the Nuclear Power Department of ASEA, Västerås, Sweden.

Mr. Rowland Parker has been transferred from Aluminium Laboratories Limited to Alcan S.A., Zürich, where he is in charge of technical development work.

Mr. Elwyn Roberts has left Sheffield University and is now a research metallurgist on the staff of the Central Electricity Generating Board.

Mr. J. Salter, Director and General Production Manager of The British Aluminium Co., Ltd., has been appointed Director of Engineering, with responsibility for civil, mechanical, and electrical engineering and building work at United Kingdom and overseas establishments.

Mr. A. B. Sorkin is now a metallurgical engineer with Pratt and Whitney Aircraft, West Palm Beach, Fla.

Dr. J. Stringer has been appointed Lecturer in Physical Metallurgy at Liverpool University.

Mr. F. W. Tomlinson, Managing Director of Pyrotenax, Ltd., has been appointed to the Board of Murex, Ltd., and also to the Board of Murex Welding Processes, Ltd.

Mr. I. G. Walker has been appointed Head of the Laboratory, Assembly Group, Ford Motor Co., Ltd., Dagenham.

Mr. D. H. Wilkinson is now with the Low Moor Alloy Steel Co., Ltd., Low Moor, Bradford.

Mr. D. J. Willetts is now with Crittall-Luxfer, Ltd., Nottingham.

Deaths

The Editor regrets to announce the deaths of:

Professor Charles Hardy Brown, of Iowa State University, on 19 January 1960.

Mr. Thomas Claude James, Chairman and Managing Director of The Wolverhampton Metal Co., Ltd., and associated companies, on 6 February 1960.

Mr. Howard William Shardlow, of Birmingham, on 9 January 1960.

OBITUARY

Mr. Herbert S. S. Murray

The Scottish Local Section has announced, with deep regret, the death of Mr. Herbert S. S. Murray, its recently appointed Chairman. No later than October 1959, the *Bulletin* published a photograph of Mr. Murray and brief biographical details of his career when he assumed the office of Local Section Chairman, and it has come as a severe blow to the Section to lose his guidance and influence after so short a period.

In a tribute to Mr. Murray at the Section's January Meeting, Mr. A. Craig McDonald, of Albion Motors Limited—a former Chairman—described him as a fine man in every sense of the word, with a large circle of friends and a wealth of experience gained in over 50 years' service in engineering, boilermaking, forging, and metal finishing. He had also a wide knowledge of electroplating and was Managing Director of two of the leading Scottish firms serving that industry. His wise counsel, friendly nature, and generosity will be greatly missed by all who knew him. Those Members of the parent body who visited Scotland for the Autumn Meeting in 1957 will remember the genial personality of Mr. Murray, who was at that time Vice-Chairman of the Local Section.

The Scottish Section has been particularly hard hit in the past year by the loss last summer of its Secretary for 14 years, Mr. Matthew Hay, and now by this most recent bereavement.

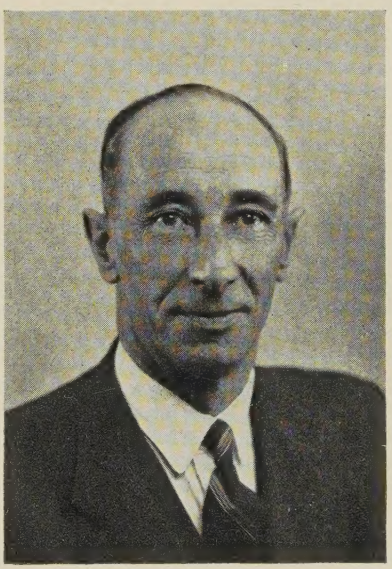
J. H. S.

LOCAL SECTION NEWS

Scottish Local Section

The Committee of the Scottish Local Section has appointed the Vice-Chairman, Mr. James H. Stuart, to succeed the late Mr. H. S. S. Murray as Chairman of the Section.

Although an East of Scotland man, Mr. Stuart has also a strong connection in the West. Born in Edinburgh in 1908, he was educated at George Heriot's School and Edinburgh University, where he studied metallurgical chemistry. In 1929 he joined the staff of E. Chalmers and Co., Ltd., Leith, in the early days of their Non-Ferrous Metal Department,



specializing in the requirements of casting metals and technique in the non-ferrous foundries. He is now a Local Director of the Company. He became a member of the Institute in 1938 and has served on the Local Section Committee since 1955, taking his full share in the organization of the Autumn Meeting of 1957.

His "extra-mural" activities have embraced many years as an officer of the Auxiliary Fire Service, a keen interest in the pipe organ, golf, and the "skippership" of a motor-cruiser.

LECTURES TO LOCAL SECTIONS AND ASSOCIATED SOCIETIES

Materials for Supersonic Flight

At a meeting of the Leeds Metallurgical Society on 3 December 1959, Mr. I. L. G. Baillie, Chief Materials and Processes Engineer, Bristol Aircraft, Ltd., gave a lecture on "Materials for Supersonic Flight".

The lecturer indicated airframe designers' increased interest in the properties of metallic and non-metallic materials arising from the study of designs for supersonic civil airliners. The temperature environment was defined, and the long life (say 30,000 h total flying life, 20–25,000 h being hot) was compared with the less-severe military requirements.

For main airframe applications the use of aluminium alloys was most attractive, because of the limited development in production techniques entailed. This gave a temperature limitation around 85–125° C (i.e. Mach 1·8–2·2 approx.), but left the designer without a precise means of selecting the temperature (and hence the aircraft performance) or the specific material, owing to the almost total lack of test data for long lives. The lack of understanding of the effects of combining creep with fatigue in a complex temperature/load/time environment was expected to involve most extensive test verification if undue arbitrary penalties were to be avoided. Corrosion possibilities due to "boiling off" marine condensate each flight were also briefly discussed.

If higher speeds were required, then titanium or ferrous alloys were thought essential, and the type of each which would be appropriate was discussed. In order to approximate most closely to the production facility which double heat-treatment of aluminium alloys affords, the more conventional types of titanium and ferrous alloys were regarded as much less desirable than the more recently developed precipitation-hardening titanium alloys and stainless steels. The possible choice between titanium and ferrous materials was dependent upon the unresolved aerodynamic stiffness requirements, but titanium might be unacceptable on this count (apart from cost, which might be less important for this application than appeared at first sight, because of the weight-saving it might provide).

Finally, the use of a titanium or stainless steel structure was stated to be limited not so much by the metallic material (which would then have become reasonably insensitive to temperature or time) as by the inability to use non-metallic for many detail parts. In fact, the non-metallics appeared to limit the designers' ability to achieve optimum performance from a supersonic civil transport aircraft.

Thermal Shock

A lecture on "Thermal Shock" was delivered to the London Local Section at its meeting on 4 February, by Mr. R. J. E. Glenny, of the National Gas Turbine Establishment, Farnborough.

He said that thermal shock resulted from the system of transient strains and stresses set up when the temperature across the section of a solid body was changed suddenly and non-uniformly. The transient nature of heating and cooling shocks was illustrated by showing the manner in which temperature differences developed to a maximum and then decayed with time.

After outlining the wide range of applications in which thermal fatigue occurred as a result of repeated thermal shocks, some of the techniques that had been used to study thermal-fatigue behaviour were described. Particular emphasis was laid on the transient thermal problem in aircraft gas-turbine blading.

The factors that influenced thermal-fatigue behaviour were sub-divided into those that determined the nature and magnitude of the thermal strains and those that influenced the resistance of the material to the thermal strains. The effects on thermal endurance (i.e. the number of cycles to produce one or more cracks of a finite size) of varying the thermal properties of the material, the size and shape of the specimen, the heat-transfer coefficient, and the temperature difference of the cycle were described.

A study of the relative effects of rapid heating and rapid cooling, by a laboratory technique based on the use of hot and cold fluidized beds, showed that rapid heating resulted in considerably lower endurances than rapid cooling. This was considered to be due to the development of residual tensile strains at the upper cycle temperature when the heating shock was complete and the entire specimen was of uniform temperature.

The interdependence of mechanical properties and microstructural characteristics of the material, the cycle time and temperature, and the environment was described. The separate effects on thermal endurance of varying the upper cycle temperature, the exposure time at this temperature, and the nature of the environment were illustrated by laboratory test data. After discussing the importance of such mechanical properties as yield point, Young's modulus and cohesive strength, the lecturer emphasized the role of cyclic plastic strain in thermal-fatigue failure.

OTHER NEWS

Symposium on "Refractory Materials and Alloys"

The Metallurgical Society of the A.I.M.E. is organizing a symposium on "Refractory Materials and Alloys", which will be held on 25–26 May at the McGregor Centre, Wayne State University, Detroit, Mich. Details may be obtained from C. L. Corey, Department of Chemical and Metallurgical Engineering, Wayne State University, Detroit 2, Mich.

Symposium on "Powders in Industry"

A symposium entitled "Powders in Industry: Properties and Principles of Application" is being organized by the Surface Activity Group of the Society of Chemical Industry. It will be held on 29 and 30 September 1960 at the Royal Institution, Albemarle Street, London, W.1.

The programme is divided into four sections: (A) Principles of Production, (B) Properties of Powders, (C) Properties of Powders Utilized in Industrial Fields, and (D) Principles of Application and Problems for the Future. In Section C, Dr. Ivor Jenkins is contributing a paper on "Powder Metallurgy".

Further information can be obtained from the Hon. Secretary, Surface Activity Group, 14 Belgrave Square, London, S.W.1.

Abstract and Book Title Index Card Service

The Iron and Steel Institute announces a new service called the "Abstract and Book Title Index Card Service". This will consist of 5 × 3 in. cards bearing the abstracts and new book titles as published each month in the *Journal* of the Iron and Steel Institute, classified by the U.D.C. The cards will be sent to subscribers fortnightly in advance of their publication in the *Journal*. The service began with material published in the January 1960 issue of the *Journal*. Subscription rates and details of the service may be obtained from the Secretary, The Iron and Steel Institute, 4 Grosvenor Gardens, London, S.W.1.

Royal Society Scientific Relief Fund

The Royal Society has issued amended regulations for its Scientific Relief Fund, which is intended to aid such scientific men, or their families, as may from time to time require assistance.

Any member of a nationally recognized scientific Society within the British Commonwealth or the Republic of Ireland, acting through one of its officers, may bring cases of need to the attention of the Royal Society Committee.

DIARY

3–4 May. "The Determination of Gases in Metal." Joint Meeting organized by the Society for Analytical Chemistry in conjunction with The Iron and Steel Institute and The Institute of Metals. (Church House, Great Smith Street, London, S.W.1).

Joint Library

Will Members please note that the Joint Library of The Iron and Steel Institute and The Institute of Metals is situated at 4 Grosvenor Gardens, London, S.W.1 (Tel.: SLOane 0061). All requests for loans of books, &c., and for information should be made to that address, and not to 17 Belgrave Square.

ADVANCES IN INSPECTION TECHNIQUES AS AIDS TO PROCESS CONTROL IN NON-FERROUS METALS PRODUCTION

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Automatic Gauge Control in Rolling Mills. By R. B. Sims, Ph.D., M.I.Mech.E., A.Inst.P. (*Davy and United Engineering Co., Ltd., Sheffield*)

The Accuracy of Strip-Thickness Measurement by Beta and Gamma Absorption. By E. B. Bell, B.Sc. (*Isotope Developments, Ltd., Aldermaston Wharf, near Reading*)

Measurement, Inspection, and Automatic Process Control in the Steel-Strip Finishing and Tinplate Industry. By S. S. Carlisle, M.Sc., A.M.I.E.E., and J. H. Wilson, B.Sc. (*British Iron and Steel Research Association, Swansea*)

The Use of Ultrasonic Testing for the Control of Quality in the Manufacture of Aluminium Alloys and Other Non-Ferrous Materials. By J. G. Harris, B.Sc., A.I.M., and J. Crowther, M.B.E., M.Sc., F.I.M. (*James Booth and Co., Ltd., Birmingham*)

Instrumentation in Ultrasonic Flaw Detection. By D. G. W. Claydon, G.I.Mech.E. (*Aluminium Laboratories Limited, Banbury*)

Use of a Search-Coil Apparatus for Eddy-Current Testing of Copper and Its Alloys. By N. B. Harvey, M.Sc., A.I.M. (*Aston Chain and Hook Co., Ltd., Birmingham*)

The Inspection of Tubes for Flaws and Variations in Thickness. By J. B. C. Robinson, B.A., and L. T. Perriam, M.A. (*Imperial Chemical Industries, Ltd., Metals Division, Birmingham*)

Recent Advances in Radiographic Techniques. By R. Halmshaw, B.Sc., A.R.C.S., A.Inst.P. (*Armament Research and Development Establishment Fort Halstead, Kent*)

An Instrument for Measuring the Gas Content of Aluminium Alloys during Melting and Casting. By C. E. Ransley, Ph.D., F.I.M., D. E. J. Talbot, M.Sc., and H. C. Barlow (*Research Laboratories of The British Aluminium Co., Ltd., Gerrards Cross, Bucks.*)

Control Analysis of Aluminium Alloys and Copper Alloys Using Self-Recording Spectrometers. By M. Milbourn, A.R.C.S., B.Sc., F.Inst.P., and J. A. F. Gidley, B.Sc., A.Inst.P. (*Imperial Chemical Industries, Ltd., Metals Division, Birmingham*)

General Discussion

INSTITUTE OF METALS · 17 Belgrave Square, London, S.W.1

APPOINTMENTS VACANT

A NEW AND INTERESTING POST exists at the ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL for a PHYSICIST, METAL PHYSICIST, or PHYSICAL METALLURGIST (with a good honours degree and the ability to plan and interpret experiments), to carry out fundamental research aimed at providing a theoretical understanding of the mechanisms which cause changes in fuel materials when under irradiation.

There are first-class reactor facilities available for post-irradiation examination, including equipment for X-ray diffraction, electron microscopy, measurement of mechanical properties, and metallography.

The starting salary will depend chiefly on post-graduate experience.

For details send POST CARD to the Group Recruitment Officer (1599/233), U.K.A.E.A., A.E.R.E., Harwell, Didcot, Berks.

CITY OF BIRMINGHAM EDUCATION COMMITTEE

MATTHEW BOULTON TECHNICAL COLLEGE

Suffolk Street, Birmingham, 1

Principal J. C. Martin, M.A., A.M.I.E.E., A.M.Brit.I.R.E.

Applications are invited for the post of Assistant Teacher Grade "B" for Chemistry in O.N.C. Metallurgy Courses. Ability to assist in Metallurgy would be a recommendation.

Salary: £700 × £27 10*s*. and final increment £37 10*s*.—£1150.

Additional increments above the minimum of the scale may be granted for time spent in industry, commerce, professional work, or research. There are also additions to the scale for a degree or for equivalent professional qualifications.

Further particulars and application forms obtainable from the Principal.

E. L. RUSSELL,
Chief Education Officer.

GLACIER METAL CO., LTD., KILMARNOCK

Research Investigator

A Graduate Metallurgist is required to join the Metallurgy Department of the Research and Development Organization of The Glacier Metal Co., Ltd., which is situated at Kilmarnock, a few miles from the holiday resorts on the West Coast of Scotland.

The successful applicant will carry out research of a fundamental character, being responsible for deciding his own lines of work within his own field, and for the design and analysis of his experiments.

If, after a period of research work, he wishes to transfer to production management or to other kinds of technical work, opportunities in these fields are likely to exist either in Kilmarnock or in other parts of the Company.

An Honours Degree in Metallurgy or an Honours Degree in Physics with some experience in Metallurgy is desirable. Research experience would be advantageous. The preferred age range is 25–30, and a starting salary of the order of £1000–£1200 per annum is envisaged.

Applications containing brief details of age, qualifications, experience, and present salary should be sent to the Personnel Manager, Glacier Metal Co., Ltd., Kilmarnock, Ayrshire.

MECHANICAL ENGINEER/METALLURGIST

The Mond Nickel Company, Limited

DEVELOPMENT AND RESEARCH DEPARTMENT LABORATORY, BIRMINGHAM

The Mond Nickel Company, Limited, wish to appoint at their Birmingham Research Laboratories an Engineer (or other suitably qualified and experienced person) to lead their Mechanical Testing Section.

This is a senior appointment, which carries, as principal responsibilities (i) the co-ordination of programmes involving specialized property determinations of a wide range of materials; this will include research aimed at the elucidation of correlations between properties and structure; (ii) the development of mechanical test equipment to meet new requirements.

The post requires the services of a man of established reputation, and will command a commensurate salary. Pension and assurance schemes are in operation and, in appropriate cases, assistance can be given for housing. Applications, which will be treated in strict confidence, should give details of age, qualifications, and experience.

They should be addressed to The General Manager, Development and Research Department, The Mond Nickel Company, Limited, Thames House, Millbank, London, S.W.1. Please mark envelope "Confidential L 79".

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TECHNICAL WRITER required by Aluminium Laboratories Limited (the Research and Technical Organization of the International Alcan Group of Companies). Applicants should possess a degree (or an equivalent qualification) in science or engineering, and preferably some writing or editorial experience. Pension and Life Assurance scheme in operation. Apply to: Personnel Officer, Southam Road, Banbury, Oxon.

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ONE-YEAR POST-GRADUATE COURSE IN THE PHYSICS AND MECHANICS OF STRUCTURAL MATERIALS 1960–1961

Applications are invited for the one-year course which begins on 10 October 1960. Prospective students must be of graduate status in an appropriate branch of science or engineering and must have practical experience in one of the fields covered by the course.

The purpose of the course is to give instruction in the analytical methods of the theories of elasticity and plasticity and in the basic theories of the nature of materials derived from the sciences of physics, chemistry, and metallurgy.

Students who complete the course satisfactorily will be awarded the Diploma in Advanced Engineering (D.A.E.).

Further information and forms of application may be obtained from: The Warden, The College of Aeronautics, Cranfield, Bletchley, Bucks.